

### 4.2.3 Drawing Area and Menu

The drawing area is a separate component of the Trace Display Shell and has a menu that is distinct from the Trace Display Shell menu. The menu items, *Plot Type*, *Export*, *Display*, *Trace Ensemble* and *Bias Adjustment*, are described below. The drawing area menus are the second line of menu options in Figure 4.2-1.

#### 4.2.3.1 PlotType

This menu selection allows the user to select between seven available plot types for display in the drawing area: the Trace Ensemble Plot, the Expected Value Plot, the Exceedance Histogram Plot, the Non-exceedance Histogram Plot, the Exceedance Probability Plot, the Non-exceedance Probability Plot and the Flood Exceedance Probability Plot.

The interface to the pulldown menu is seen in Figure 4.2-3. The default plot type is taken from the session default display settings, as defined through the Preferences-Default Settings menu option from the ESPTrace Manager. Examples of each plot type are found in Figures 4.2-4, 4.2-5, 4.2-6a, 4.2-6b, 4.2-7a, 4.2-7b and 4.2-8 respectively.

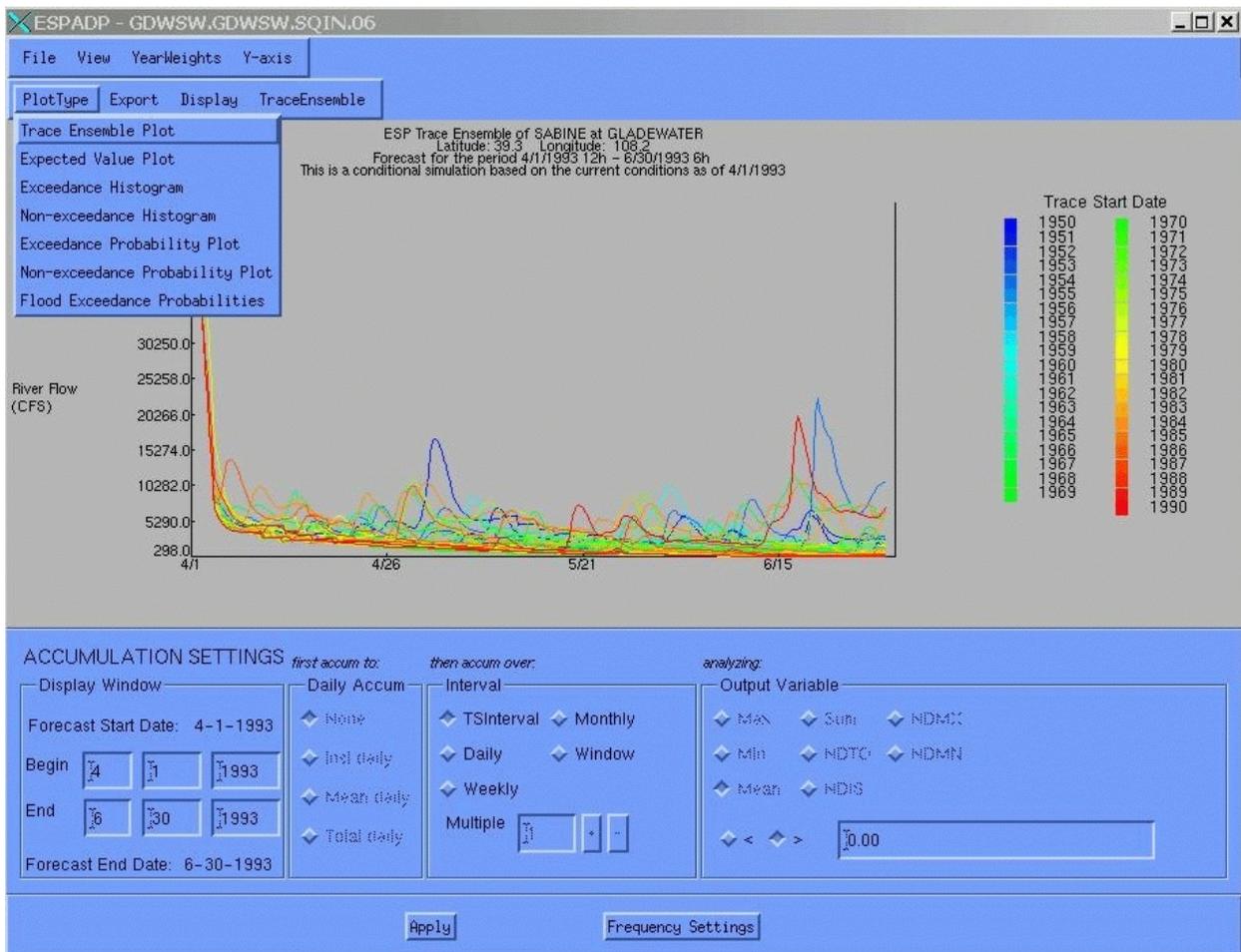


Figure 4.2-3. Drawing Area PlotType Options



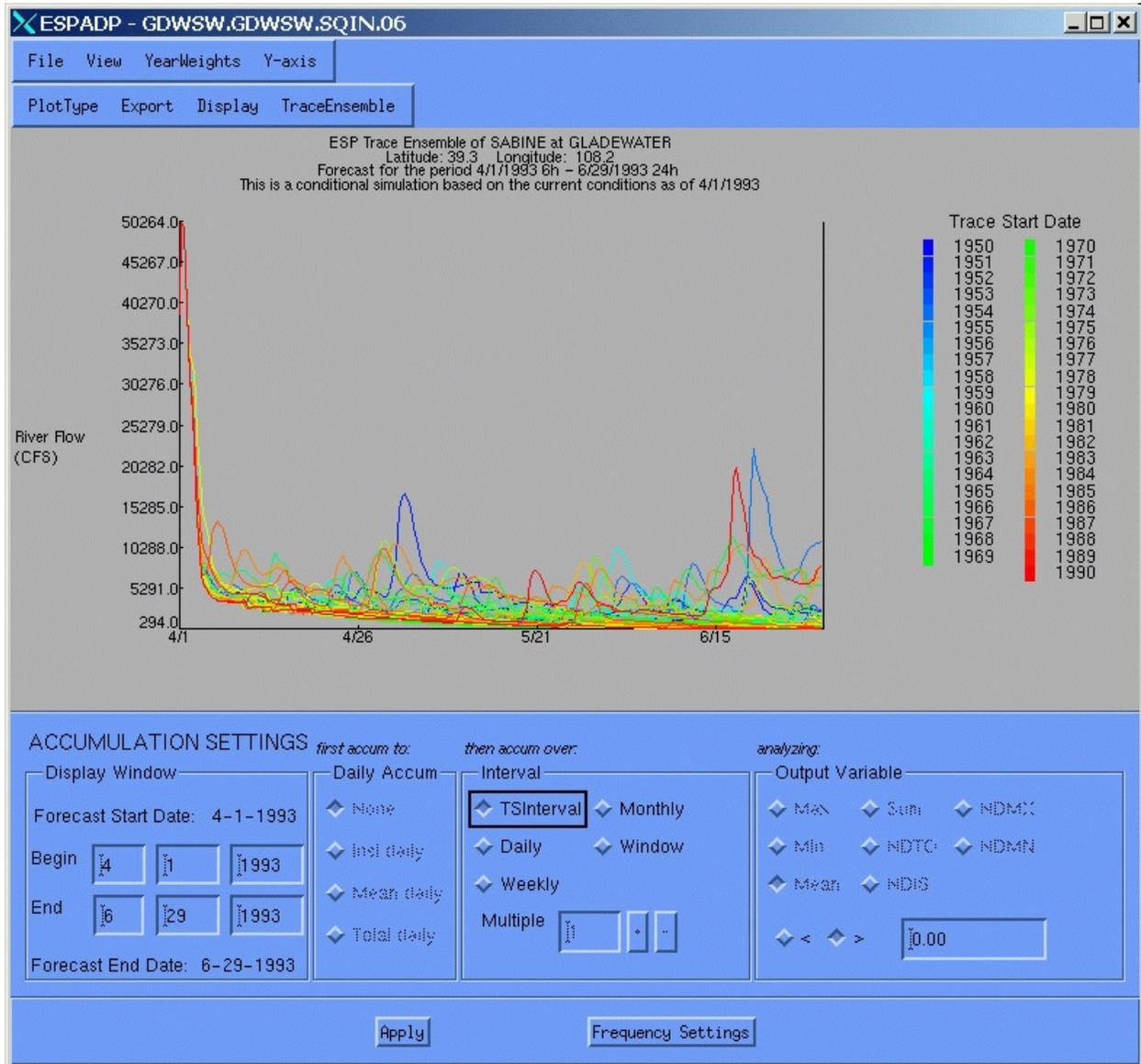


Figure 4.2-4. Trace Ensemble Plot

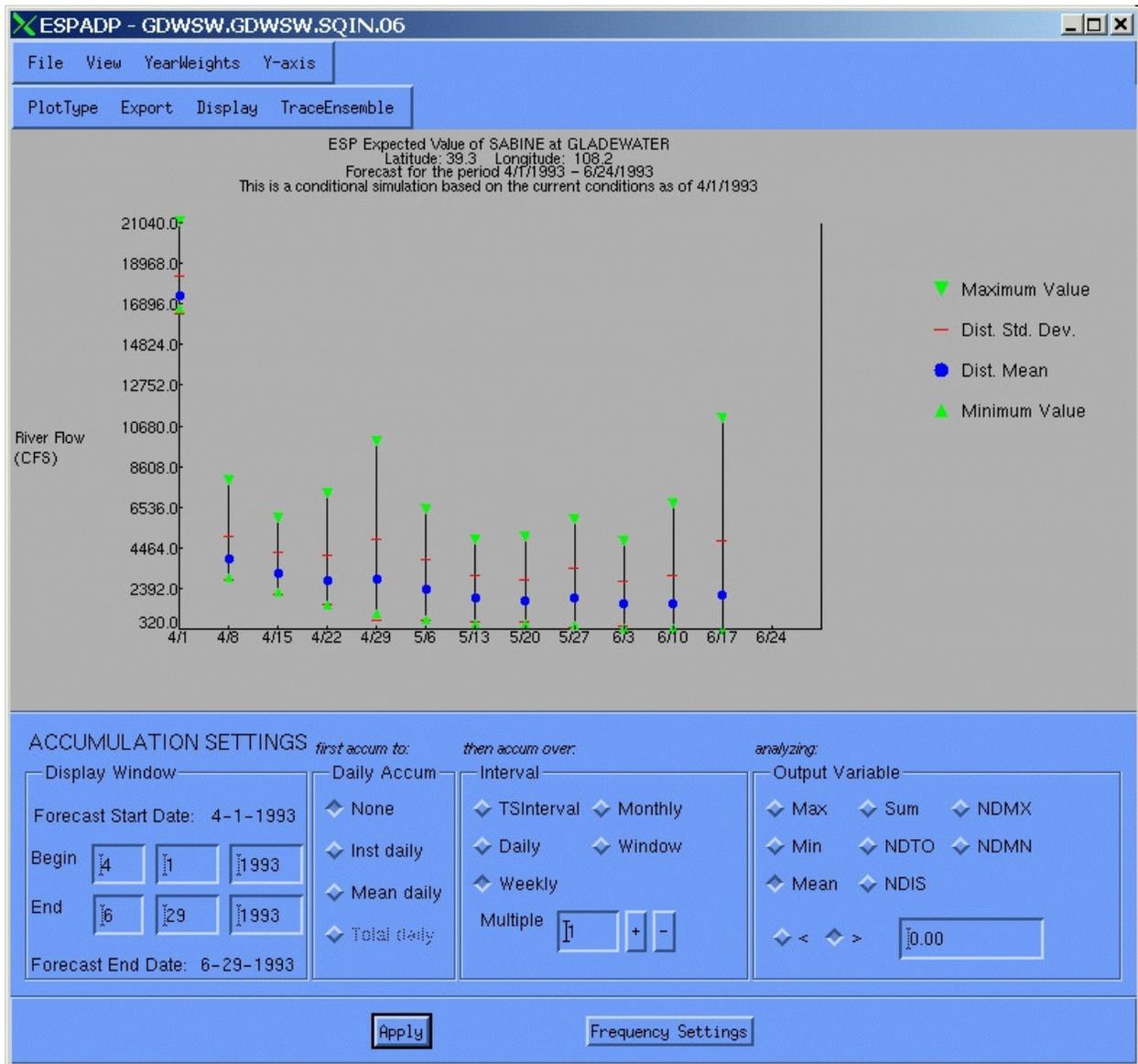


Figure 4.2-5. Expected Value Plot

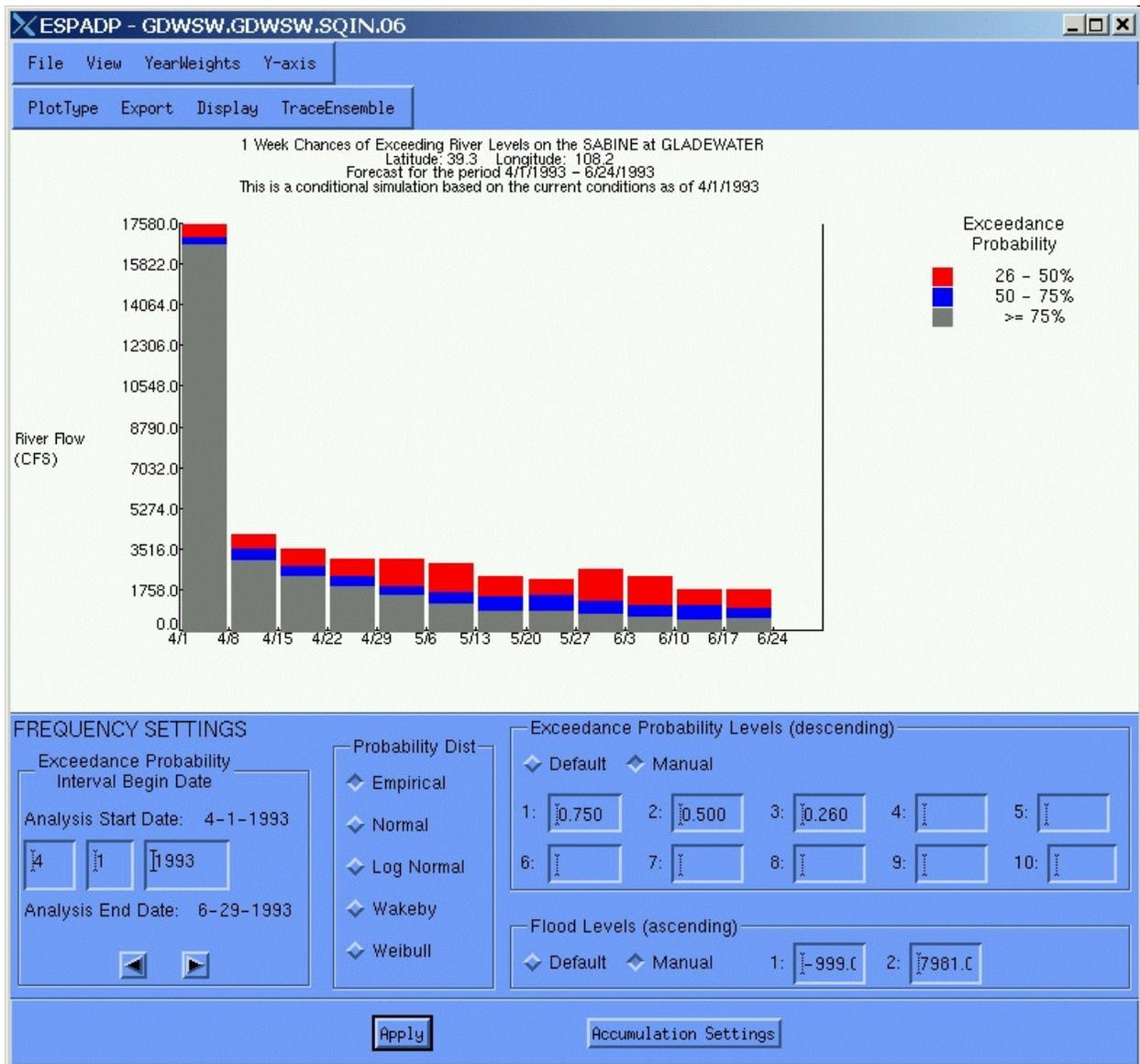


Figure 4.2-6a. Exceedance Histogram

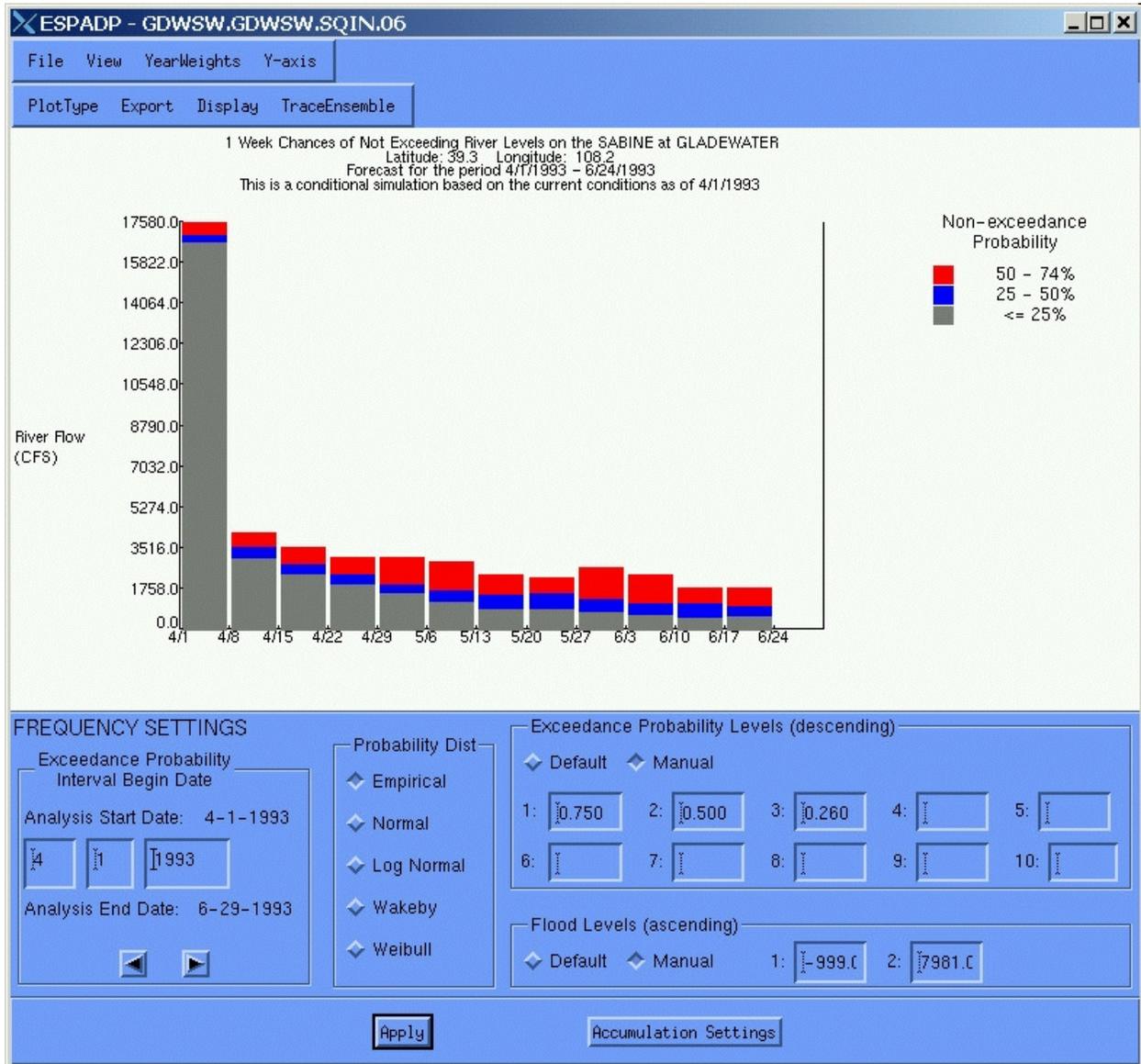


Figure 4.2-6b. Non-exceedance Histogram

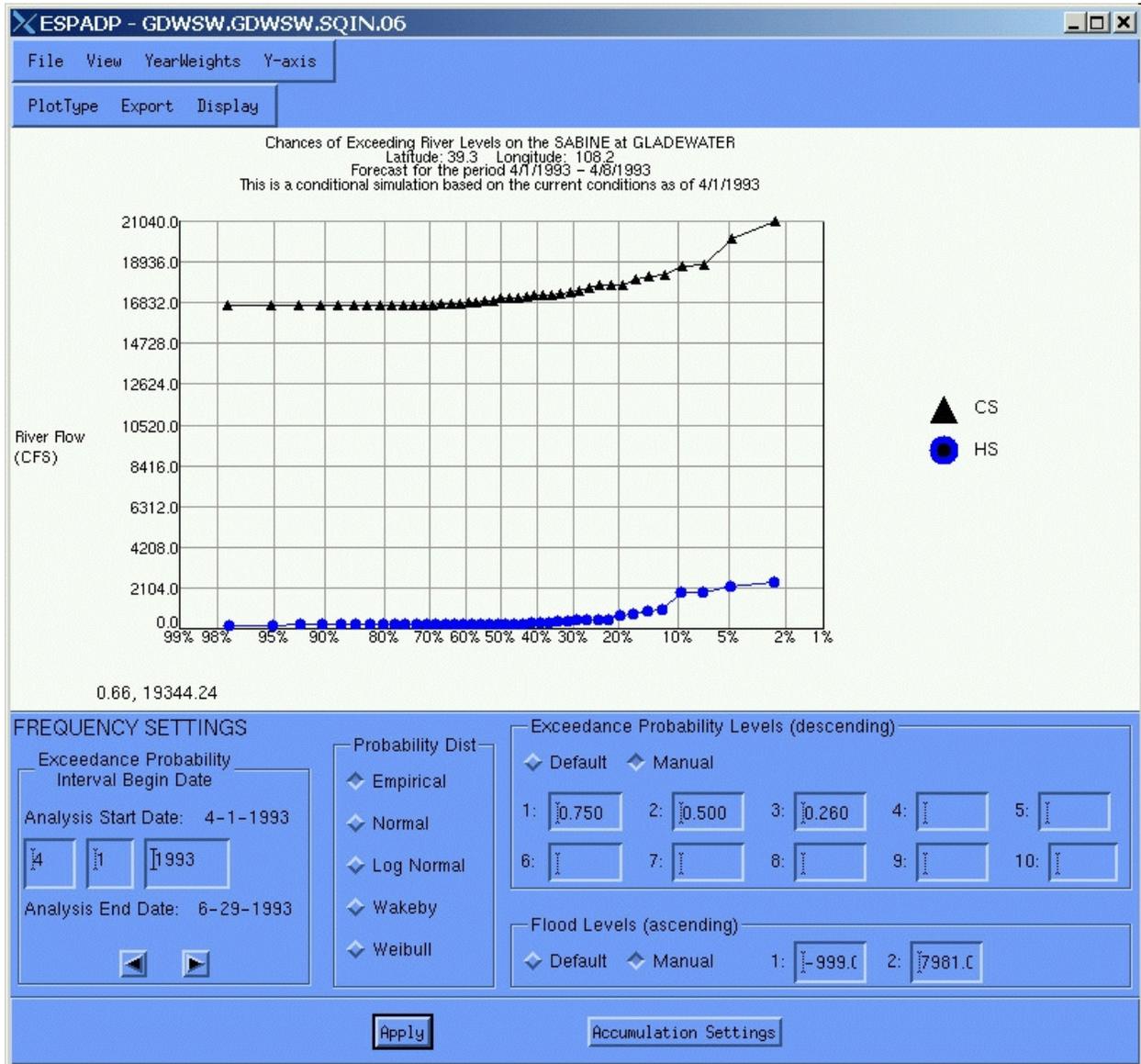


Figure 4.2-7a. Exceedance Probability Plot

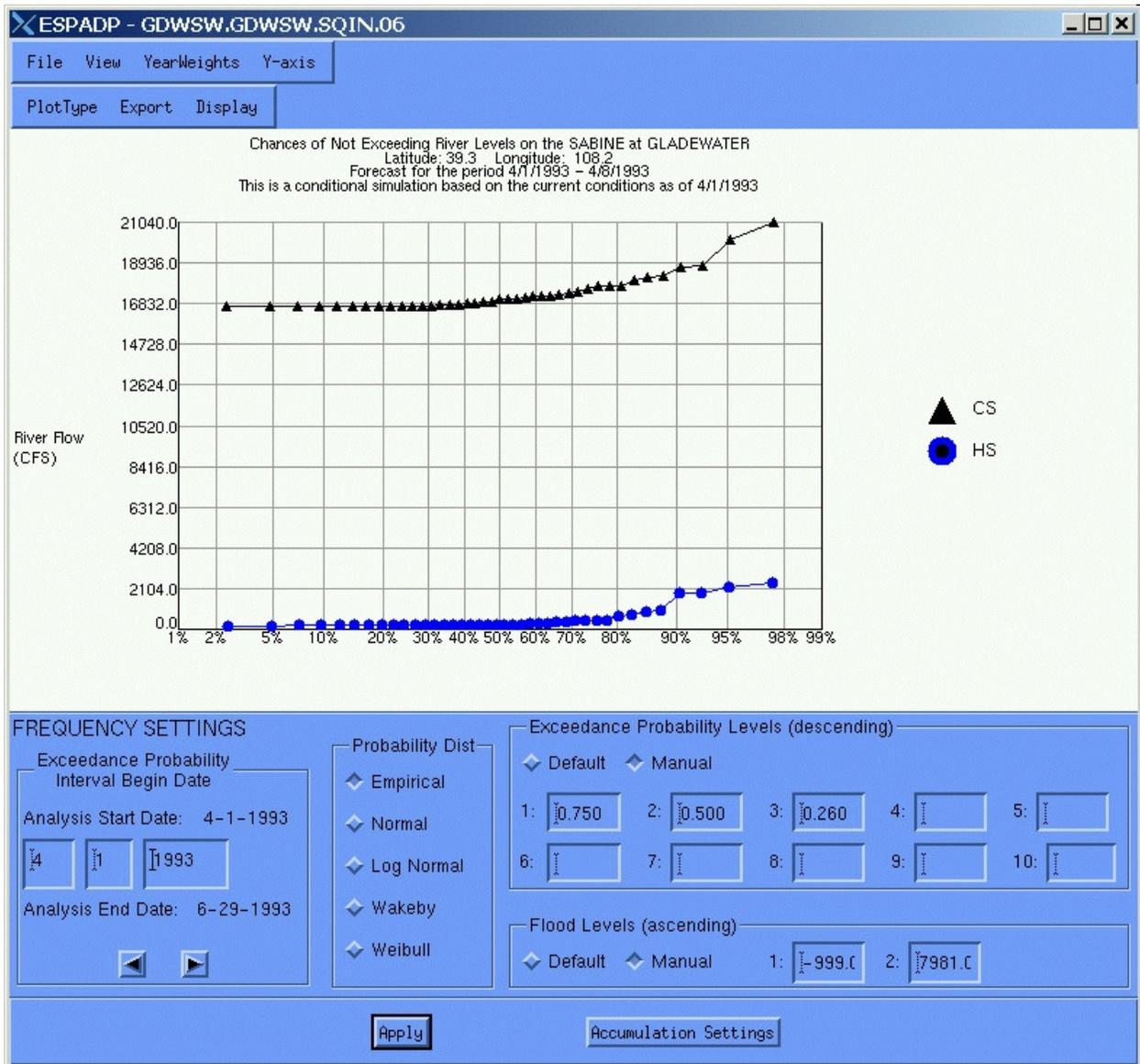


Figure 4.2-7b. Non-exceedance Probability Plot

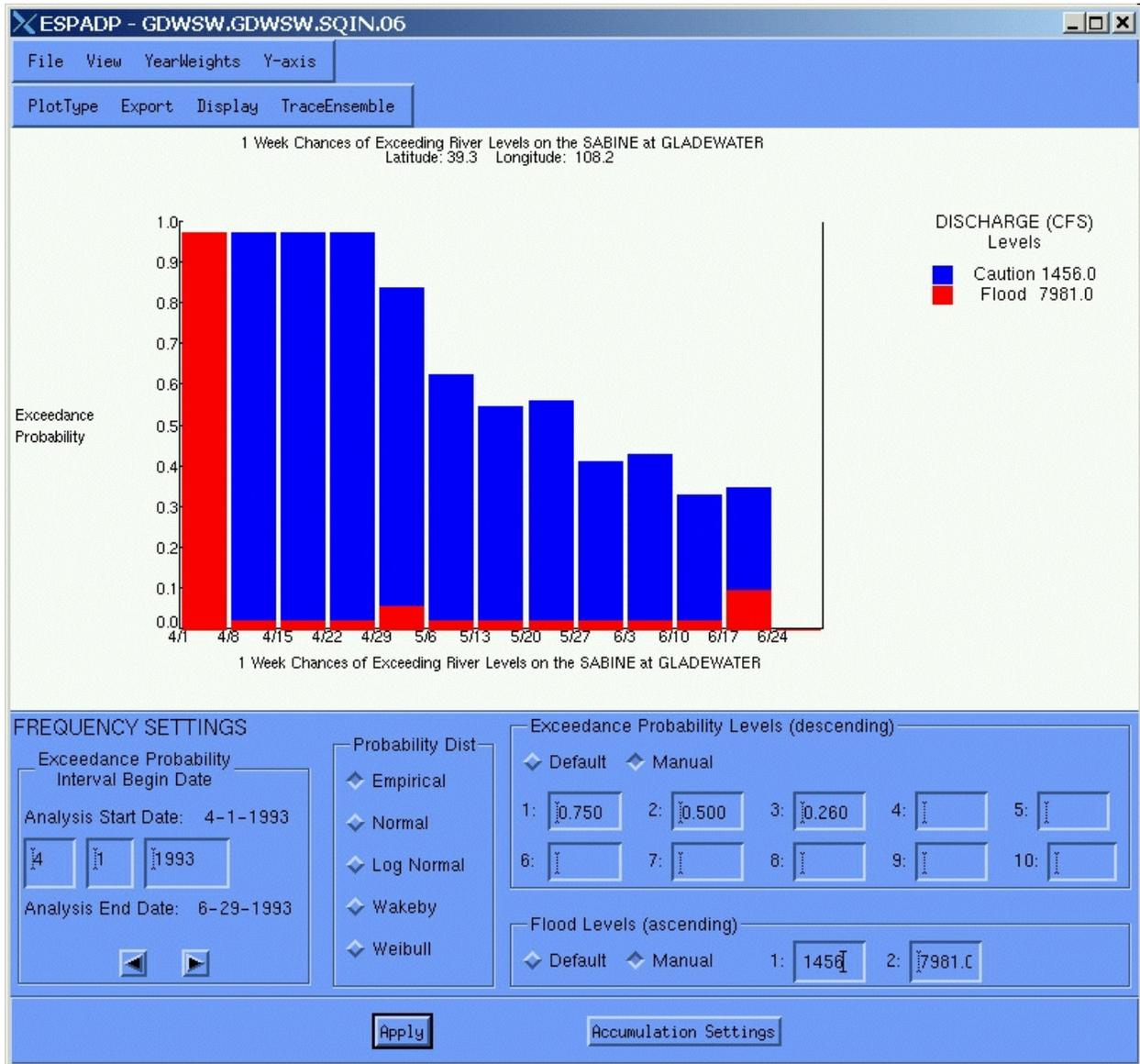


Figure 4.2-8. Flood Exceedance Probability Plot

**4.2.3.2 Export**

This menu item allows the user to export trace ensembles and analysis results to ASCII files for external processing or dissemination. Each option under Export in Figure 4.2-9 is described below.

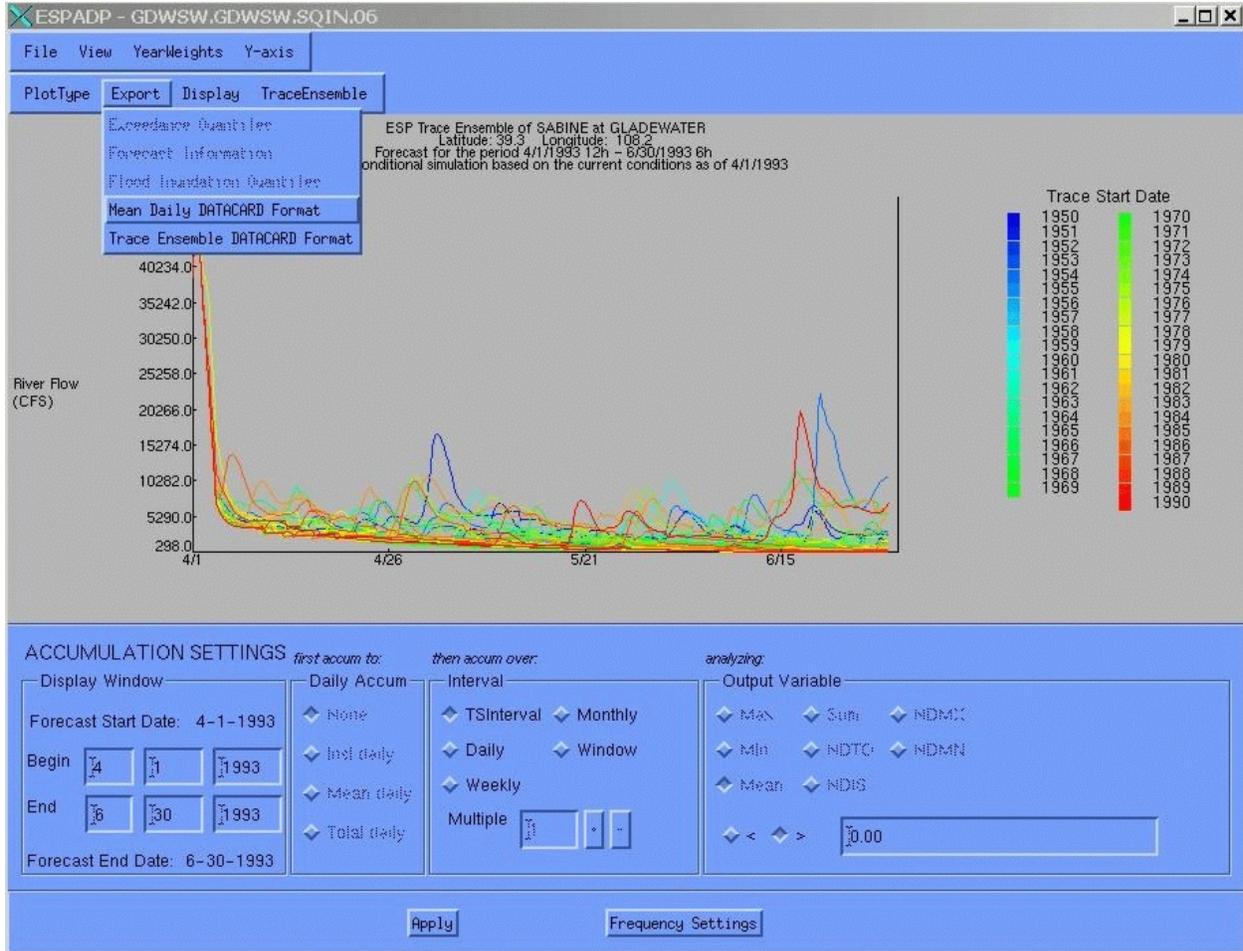


Figure 4.2-9. Drawing Area Export Options

Options

*Exceedance Quantiles* - Writes out an ASCII file of the exceedance quantile table (see the Display menu item, below).

*Forecast Information* - Writes out an ASCII file of forecast information: a table of exceedance probabilities for all time steps. This option is only available for Exceedance Histogram and Non-exceedance Histogram plot.

*Flood Inundation Quantiles* - Writes out an ASCII file for use in flood inundation mapping. This file contains a header describing the current accumulation and frequency analysis settings followed by the first line of a table of exceedance quantiles. This feature is intended for use in batch mode operation, but is accessible with limited functionality from the interface. In batch mode, subsequent writes can be made to the file using an append mode to fill in the table for multiple trace files without repeating the header.

From the interface, however, the append mode option is disabled. An example flood inundation quantile export file is shown below:

*Mean Daily DATACARD Format* - Writes out an ASCII file of mean daily values in DATACARD format. This option is available for all plot types.

*Trace Ensemble DATACARD Format* - This option writes out the selected trace ensemble in an ASCII format file. A dialog box displays the default filename and directory for the DATACARD file. A different filename and directory may be chosen by the user to override the defaults. The ASCII file to be written will consist of an ESPTrace file information header followed by the time series traces, each formatted as a separate DATACARD format time series.

### 4.2.3.3 Display

From this menu item the user can open a text display window to show technical information about the current trace file, display exceedance quantile information, toggle the flood stage indicator, overlay data from the processed database, show the rating curve, modify the graph's text labels and fonts or show the X probability dialog interface. Each menu option highlighted in Figure 4.2-10 is described below.

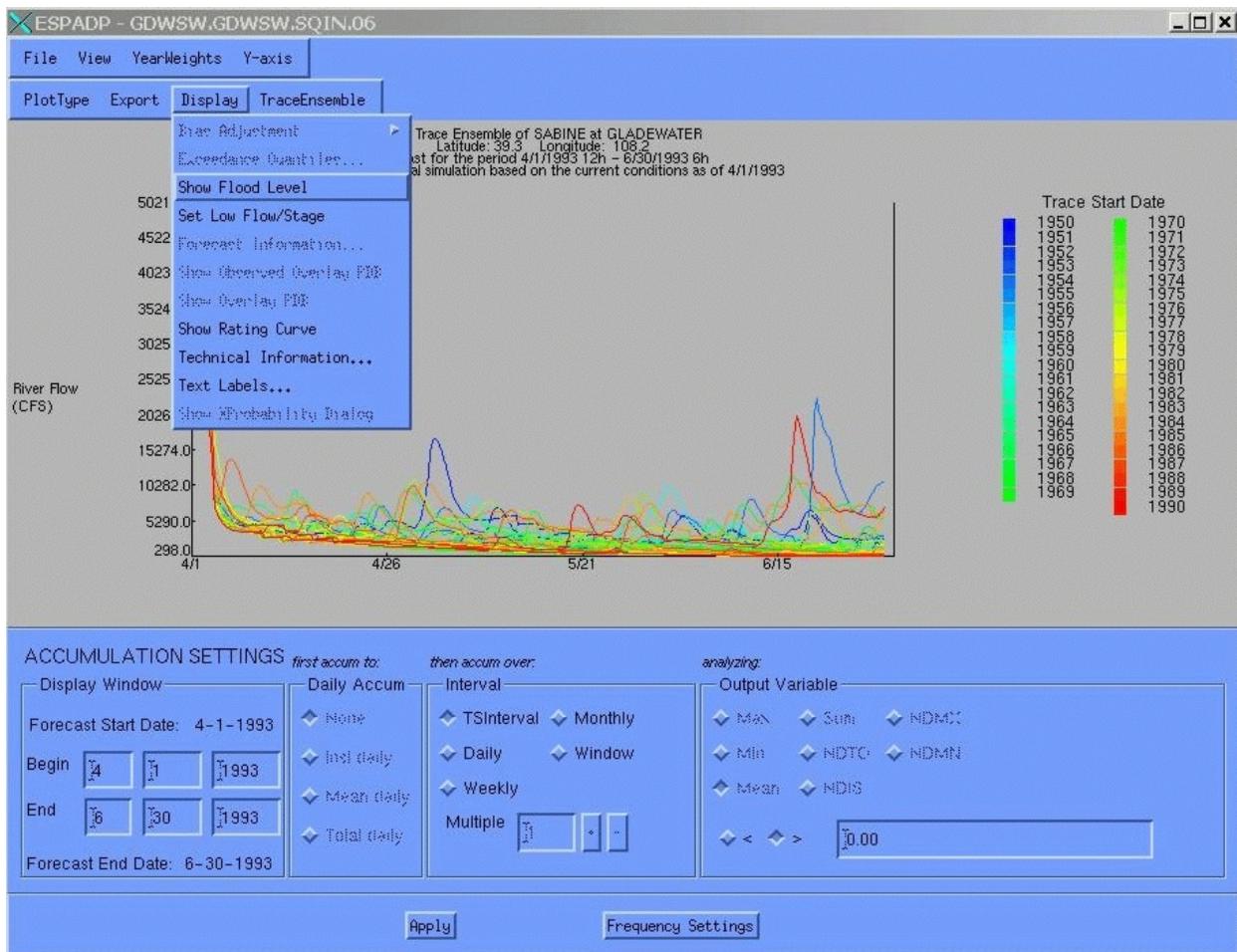


Figure 4.2-10. Drawing Area Display Options

#### 4.2.3.3.1 Bias Adjustment

A bias adjustment may be performed to adjust the conditional frequency analysis to be consistent with the difference between the results for the observed and historical simulated data. This adjustment is only displayed on the Exceedance Probability Plot and is therefore not available as an option for the other plots. The time interval over which the analysis is to be performed must be set to Window (see Section 4.2.1.1) and all three trace types (CS, HS and OBS) must be available. The available options for the bias adjustment are on or off.

When the bias adjustment is turned on:

1. a new exceedance curve is generated from the old CS exceedance curve
2. the new exceedance curve is labeled in the legend as:

CS Adj. ( $r^2 = \#.##$ )

where  $\#.##$  is a number (for example 0.23)

3. the OBS curve is removed

The process used to generate the new time series is as follows:

1. Collect the CS, HS and OBS points for the window. Since the interval must be set to window for the bias adjustment to be available, there will be only one point per year for each trace type.
2. Match the HS and OBS points by year, discarding those without a match.
3. Perform a linear regression, estimating the coefficients a and b in the following equation :

$$Y = a * X + b$$

where Y is the observed (OBS) variable and X is the historical simulation (HS) variable

The coefficients are estimated using the usual least squares method. A byproduct of the computation of the coefficients is the correlation coefficient between the OBS and HS data. The correlation coefficient is provided in the legend of the Exceedance Probability Plot as the value after the " $r^2$ ".

4. Apply the linear equation to the CS data to acquire the new points:

$$CS^{new} = a * CS^{old} + b$$

#### User Notes

In addition to the menus, the drawing area has several other areas of user interaction. On all plots, as the pointer passes over the drawing area the coordinates of the pointer are displayed in the lower left corner of the drawing area, allowing the user to more precisely identify values and dates.

In the trace ensemble plot the user may highlight a given trace year by clicking with the mouse on the

color for that year in the legend at the right of the plot. To remove the highlight, the user must click elsewhere in the grey area surrounding the plot. Likewise, in the exceedance probability plot the user can toggle the display of data for each time series type (conditional, historical or observed) by clicking on the associated legend item. In this case, a single click on the legend item toggles the display on or off.

#### 4.2.3.3.2 Exceedance Quantiles

This option displays an exceedance quantile table with header information. The header contains source information for the exceedance quantiles including the source trace file and current accumulation and frequency settings. A table of quantiles associated with the current exceedance probability levels is shown for the conditional, historical and observed data, if available. The actual sample points are also tabulated, showing for each point the trace year, data value, year weight and Weibull plotting position. Figure 4.2-11 provides an example of an exceedance quantile display or export.

#### 4.2.3.3.3 Show Flood Level

This menu option is a toggle and is only enabled when a rating curve is found that contains a valid primary or warning flood stage. If this option is toggled on, the user may elect to overlay the flood stage and/or discharge on plots.

#### Options

No options available.

#### User Notes

A default preference may be specified. See Section 4.1.3.2.2, Default Settings, for more details.

#### 4.2.3.3.4 Set Low Flow/Stage

This menu option is not available for the Flood Exceedance Probability PlotType. When this option is selected, a window pops up for inserting Flow/Stage value and use it to draw the Flow/Stage line on the current plot.

#### Options

No options available.

#### User Notes

A default preference may be specified. See Section 4.1.3.2.2, Default Settings, for more information.

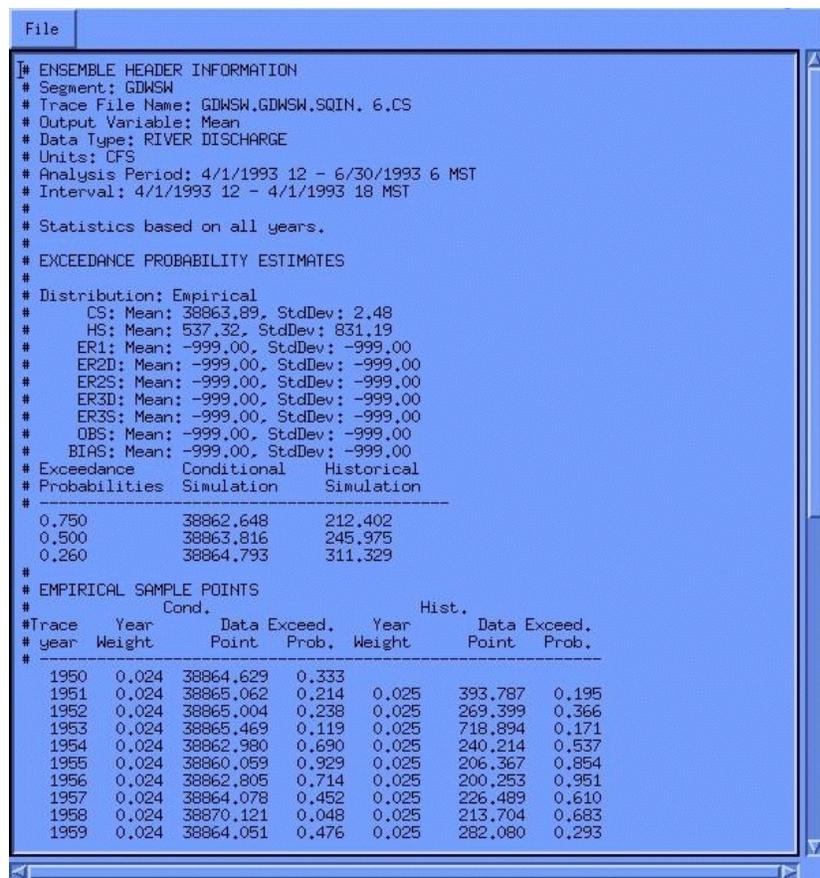


Figure 4.2-11. Exceedance Quantile Display

#### 4.2.3.3.5 Forecast Information

Pops up a window of the forecast information: a table of exceedance probabilities for all time steps. This option is only available for Exceedance Histogram and Non-exceedance histogram plots.

Options

No options available.

User Notes

A default preference may be specified. See Section 4.1.3.2.2, Default Settings, for more information.

**4.2.3.3.6 Show Observed Overlay PDB**

This menu option is a toggle and is available for the Trace Ensemble Plot, Expected Value, Exceedance Histogram and Non-Exceedance Histogram plot types when observed data from the Processed Data Base are available for the current datatype. When selected this feature displays observed data from the Processed Data Base over the current plot.

Options

No options available.

User Notes

A default preference may be specified. See Section 4.1.3.2.2, Default Settings, for more information.

**4.2.3.3.7 Show Overlay PDB**

This menu option is a toggle and is available for the Trace Ensemble Plot, Expected Value, Exceedance Histogram and Non-Exceedance Histogram plot types when forecast data are available from the Processed Data Base over the current display window for the current datatype. When selected this feature displays forecasted data from the Processed Data Base over the current plot.

Options

No options available.

User Notes

A default preference may be specified. See Section 4.1.3.2.2, Default Settings, for more information.

**4.2.3.3.8 Show Rating Curve**

This menu option is a toggle and is only enabled when a valid segment rating curve has been read. Rating curve conversions from stage to flow or from flow to stage are only valid over instantaneous data accumulations.

Options

No options available.

User Notes

A default preference may be specified. See Section 4.1.3.2.2, Default Settings, for more information.

**4.2.3.3.9 Technical Information**



Figure 4.2-12. Technical Information Display

This option displays technical information about the time series trace file, including the historical period, the forecast period and current frequency settings such as distribution and parameters, as well as information about a Year Weight File currently in use, if any. Figure 4.2-12 provides an example of a Technical Information display.

#### 4.2.3.3.10 Text Labels

Text labels and fonts associated with each label on each drawing area may be modified by the user. Figure 4.2-13 shows the dialog that demonstrates this. The label may be modified within this dialog by clicking on the right arrow button next to the label. A font selector (Figure 4.2-14) appears. This selector allows the user to browse through all the fonts available on the current system. The sample sentence, “The quick brown fox jumped over the lazy dog.” demonstrates how the label will appear with selected fonts.

#### Options

No options available.

#### User Notes

Clicking on *Usefont* in the font selector only modifies the label in the label dialog. To apply these changes to the graph, the user must select the *Apply* button in the label dialog.

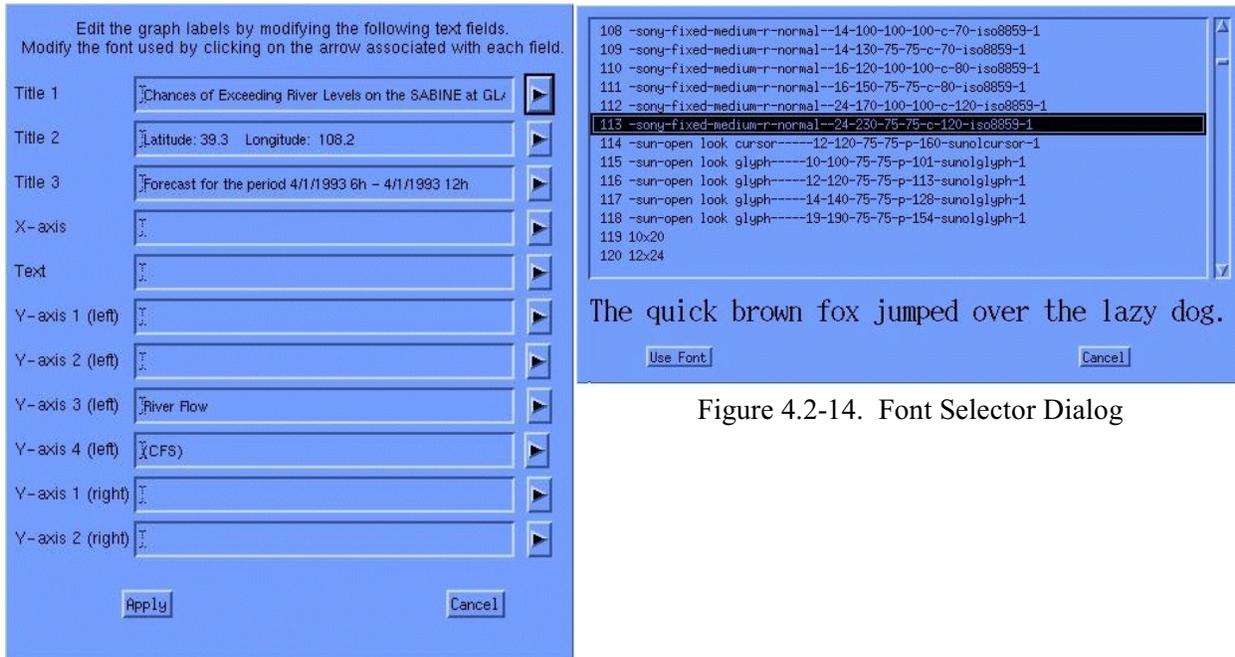


Figure 4.2-13. Graph Labels Dialog

Figure 4.2-14. Font Selector Dialog

#### 4.2.3.3.11 Show X Probability Dialog

This option toggles a probability range selection dialog. The dialog appears in the upper right corner of the display shell (see Figure 4.2-15). The minimum and maximum desired probability values can be specified and highlighted to preview those data points that will be included should the user elect to create a new ensemble. Once the user selects this option, a new display shell is launched containing those years within the selected probability range.

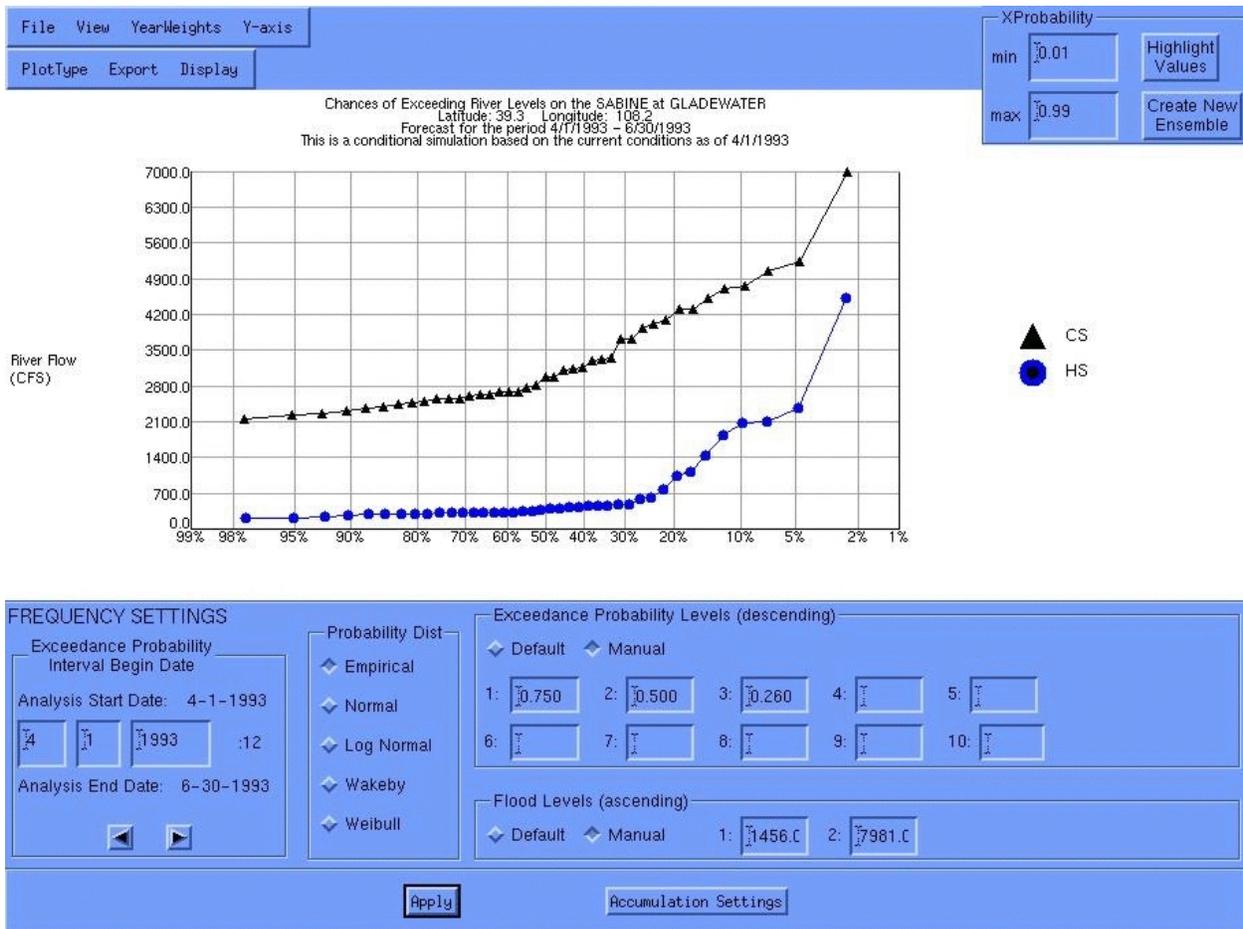


Figure 4.2-15. X Probability Dialog

Options

No options available.

User Notes

To access this option, the user must be viewing an exceedance probability plot over an entire interval (forecast window). Note that manipulation of the new ensemble is limited to viewing traces and to exporting one or all of the individual time series in datacard format.

**4.2.3.4 Trace Ensemble**

This menu item is only available for the Trace Ensemble Plot and the Probability Interval Histogram plot. For each of these plots data from only one trace file may be displayed. From this menu item the user may choose to have the conditional, historical or observed trace data displayed in the respective plots. Because analysis data from all three time series types can be shown on the exceedance probability plot, this menu item is not needed and is unavailable.